[SPECIFICATION]

[TITLE OF THE INVENTION]

Washing method for full automatic washing machine

[BRIEF DESCRIPTION OF THE DRAWINGS]

FIG. 1 is a sectional view illustrating a related art pulsator washing machine based on an agitation type;

FIG. 2 is a sectional view illustrating a washing machine in accordance with the present invention;

FIG. 3 is a sectional view for describing a centrifugal penetration washing process of a washing machine in accordance with the present invention;

FIG. 4 is a sectional view for describing an agitation washing process of a washing machine in accordance with the present invention;and

FIG. 5 is a plane sectional view for describing a restoration circulation washing process of a washing machine in accordance with the present invention.

- Description of reference numerals for main parts in the drawings.

101: washing machine

102: outer tub

103: inner tub

104: washing hole

105: pulsator coupled to inner tub

106: driving shaft

107: motor

[DETAILED DESCRIPTION OF THE INVENITON]

[OBJECT OF THE INVENTION]

[FIELD OF THE INVENTION AND DISCUSSION OF THE RELATED ART]

The present invention relates to a full automatic washing machine, and more particularly, to a washing machine, in which washing water discharged to an outer tub through a through hole of an inner tub is pushed to the upper part of the inner and outer tubs by a rotating force of the inner tub being connected to a driving shaft of a motor to provide the washing water to the inner tub again, thereby performing centrifugal penetration washing and rinsing processes and also in which the number of rotations of the inner tub is reduced to rotate the inner tub being integrally formed with a pulsator in regular and reverse directions, thereby performing agitation washing and rinsing processes. Also, as laundry and the washing water keep rotating when the inner tub is suddenly stopped to change the direction, the amount of washing water and detergent required for the washing and rinsing processes is reduced and damage to and entangle of the laundry are minimized.

FIG. 1 is a sectional view of a related art pulsator washing machine based on an agitation type. The washing machine 1 includes an outer tub 2, an inner tub 3, a pulsator 4, a washing shaft 6, a dewatering shaft 6-1, a clutch 7, a motor 8, and a drain valve 9. The outer tub 2 is for storing washing water. The inner tub 3 is installed inside the outer tub 2 for washing laundry. The pulsator 4 is installed on the inner bottom face of the inner tub 3 for performing the agitation washing process by providing a mechanical rotating force to the laundry by rotating in regular and reverse directions. The washing shaft 6 is coupled to the pulsator 4 for rotating the pulsator 4 in the regular and reverse directions. The dewatering shaft 6-1 is coupled to the inner tub 3 for rotating the inner tub in one direction. The clutch 7 couples the washing shaft 6 with the dewatering shaft 6-1 or separates them from each other. The motor 8 is connected to the clutch 7 by a belt and delivers the rotating force to drive the clutch 7. The drain valve 9 is coupled to the outer tub 2 to discharge the washing water in the outer tub 2 out of the washing machine.

An operation of the related art washing machine will be described below.

First, laundry is put into an inner tub 3 of a washing machine and washing water is provided when a start button is pressed. When more than a certain amount of washing water is provided into the inner and outer tubs 3 and 2, water supply is stopped by a sensor.

At the same time as the water supply is stopped, the motor 8 rotates in regular and reverse directions to rotate the washing shaft 6 in regular and reverse directions as well.

Accordingly, the pulsator 4 being connected to the washing shaft 6 is rotated in both regular and reverse directions, thereby performing the washing process.

When the washing process is completed, the drain valve 9 is opened to drain the washing water in the outer tub 2, thereby performing the draining process.

To perform the dewatering process after the draining process is completed, the inner tub 3 and the pulsator 4 rapidly rotate together in one direction in a state that the washing shaft 6 and the dewatering shaft 6-1 are coupled with each other. In this way, the washing water in the inner tub 3 is drained to the outer tub 2 through a plurality of washing holes 5 and the washing water drained to the outer tub 2 is drained out of the washing machine through the drain valve 10.

In the related art washing machine, however, as the washing process is performed by the agitation caused by the regular and reverse rotations of the pulsator, damage to and entangling of the laundry inevitably comes to occur.

Also, because a lot of washing water need to be provided to the outer tub 2 to wash and rinse the laundry, the amount of the washing water and detergent and time for supplying and draining washing water are increased.

[TECHNICAL TASKS TO BE ACHIEVED BY THE INVENTION]

Accordingly, the present invention is directed to a construction of a tub cover of a full automatic washing machine that substantially obviates one or more of the problems due to limitations and disadvantages of the related art.

An object of the present invention is to reduce the amount of washing water required for the washing and rinsing processes, thereby obtaining a water saving effect.

Another object of the present invention is to reduce the amount of detergent required for the washing process.

Another object of the present invention is to save the whole washing process time by reducing water supplying and draining time period.

Another object of the present invention is to minimize damage to and entangle of laundry, thereby improving the washing efficiency.

A full automatic washing machine is disclosed, in which washing water discharged to an outer tub through a through hole of an inner tub is pushed to the upper part of the inner and outer tubs by a rotating force of the inner tub being connected to a driving shaft of a motor to provide the washing water to the inner tub again, thereby performing centrifugal penetration washing and rinsing processes and also in which the number of rotations of the inner tub is reduced to rotate the inner tub being integrally formed with a pulsator in regular and reverse directions, thereby performing agitation washing and rinsing processes. Also, laundry and the washing water keep rotating when the inner tub is suddenly stopped to change the direction.

[PREFERRED EMBODIMENTS OF THE INVENTION]

The present invention will be described in detail with reference to FIGs. 2 to 5.

A washing machine 101 includes an inner tub 103, to the lower part of which a pulsator 105 is coupled and a motor 107 of variable speed, having a driving shaft 106 directly connected to the inner tub 103. In this washing machine, a penetration washing process and a rinsing processes are performed as washing water is pumped toward the upper part of the inner tub 103 and provided to the inner tub 103 again by a centrifugal force generated by rapid rotations of the inner tub in regular and reverse directions.

In a washing machine 101 having the above structure, the following processes are

included. In a penetration and rinsing processes, the washing water in the inner tub 103 is pumped toward the upper part of the inner tub 103 and provided to the inner tub 103 again by a centrifugal force generated by rapid rotations of the inner tub 103 in regular and reverse directions. In an agitation washing process and a rinsing process, the inner tub 103 is slowly rotated in regular and reverse directions to perform the washing and rinsing processes. Also, in a restoration circulation washing process and a rinsing process, the washing water and laundry are rotated by remaining force by inertia when the inner tub 103 is suddenly stopped, thereby performing washing and rinsing processes.

An operation of the present invention will be described below.

FIG. 2 is a sectional view illustrating a washing machine in accordance with the present invention.

First, laundry is put into an inner tub 103 of a washing machine 101. Then, washing water is provided when a start button is pressed. When more than a certain amount of washing water is provided in the inner tub 103 and an outer tub 102, water supply is stopped and the washing cycle is started. The washing cycle is performed by the rotation of a motor 107. That is, a driving shaft 106 is rotated in regular and reverse directions by regular and reverse rotations of the motor and the inner tub 103 is rotated in regular and reverse directions by the regular and reverse rotations of the driving shaft 106.

In this way, the washing operation is performed by a water flow of the washing water, the water flow being generated by regular and reverse rotations of the inner tub 103. At this time, the processes of a penetration washing and an agitation washing are performed by increasing or decreasing the speed of the rotating force of the motor 107.

To perform the penetration washing process, the number of the rotation of the motor 107 need to increase. That is, when the number of the rotation of the motor 107 fully increases, the number of rotation of the driving shaft 106 and the inner tub 103 increase as well, thereby

strengthening the centrifugal force. Accordingly, the laundry is pushed to the inner faces of the inner tub 103 by the centrifugal force and the washing water passes through textures of the laundry. In this way, the laundry is washed better as contaminants on the laundry is peeled off by the washing water passing through the textures of it.

The washing water which passed through the textures of the laundry is drained to the outer tub 102 through washing holes of the inner tub 103. Then, the washing water drained to the outer tub 102 goes up along the interval of the inner and outer tubs 103 and 102 by the centrifugal force generated by the rapid rotation of the inner tub 103. Of course, the washing water provided on the bottom face of the outer tub 102 also goes up to the upper part along the interval of the inner and outer tubs 103 and 102 by the centrifugal force.

The washing water of the upper part of the inner and outer tubs 103 and 102 is provided to the inner tub 103. The washing water which drops from the upper part of the inner tub 103 into the inner tub 103 can give a great impact to the laundry in the inner tub.

Accordingly, better washing efficiency is obtained because of a pounding effect of the washing water. Also, as the washing water is provided to the inner tub 103 again in the penetration washing process, the water for washing is saved.

In other words, the washing water in the inner tub 103 plays an important role in washing the laundry but the washing water in the outer tub 102 does not do anything for the washing process. In fact, the washing water in the outer tub 102 interferes with the rotation of the inner tub 103 by generating a frictional force when the inner tub 103 is being rotated.

Accordingly, for a smooth rotation of the inner tub 103, less contact with the washing water in the outer tub 102 is required.

In the washing machine of the present invention, however, the washing water amounting to a half of the washing water required for the related art washing machine is provided to the inner and outer tubs 103 and 102 and then, the washing water in the outer tub

102 is provided to the inner tub 103 again. Accordingly, because less amount of washing water exists in the outer tub 102 compared to the related art washing machine while the same amount of the washing water is required in the inner tub 103, the inner tub 103 can be more smoothly rotated.

In this way, the water for washing is saved and thus, less amount of the detergent is needed. Also, time for supplying and draining washing water is reduced.

FIG. 4 is a sectional view illustrating an agitation washing process of a washing machine in accordance with the present invention. For performing the agitation washing process, the number of rotations of the motor 107 need to be reduced.

Also, as the number of rotation of the motor 107 is reduced, less centrifugal force is generated, by which the washing water drained to the washing hole of the inner tub 103 is accumulated in the outer tub 102 without going up to the upper part. Accordingly, the water level of the outer tub 102 becomes to be same as that of the inner tub 103.

At this time, the laundry in the inner tub 103 is washed by the agitation process of the pulsator 105 being integrally formed with the inner tub 103.

When the agitation washing process by the pulsator is performed, the laundry being pushed to the inner wall of the inner tub 103 in time of the penetration washing process is loosen and sunk in the washing water, thereby obtaining an improved washing efficiency.

Also, it is possible to perform the penetration washing process and the agitation washing process repeatedly.

FIG. 5 is a plane sectional view for describing a restoration circulation washing process of a washing machine in accordance with the present invention. As shown in FIG. 5, the washing process can be performed by the restoration circulation process by suddenly stopping the inner tub 103 in time of the penetration washing process.

In other words, when the inner tub is suddenly stopped to be turned in the reverse

direction when the motor 107 is being rapidly rotated, the washing water and the laundry in the inner tub 103 tend to rotate in the original direction by the inertia.

At this time, a pounding effect is generated as the laundry is bumped against the inner tub 103 and the pulsator 105 being integrally formed with the inner tub.

In this way, better washing effect is obtained as the restoration circulation process is maintained even in time that the rotation direction of the inner tub 103 is changed.

When the processes of the penetration washing, the agitation washing, and the restoration circulation washing are completed, the drain process is performed and then, the washing water is provided again to perform the rinsing process. In the rinsing process as well, the penetration rinsing process can be performed or both of the penetration rinsing process and the agitation rinsing process can alternatively be performed. Of course, when the rotiation direction of the inner tub 103 is changed, the restoration circulation rinsing process is performed.

[ADVANGTAGE OF THE INVENTION]

A full automatic washing machine is disclosed, in which washing water discharged to an outer tub through a through hole of an inner tub is pushed to the upper part of the inner and outer tubs by a rotating force of the inner tub being connected to a driving shaft of a motor to provide the washing water to the inner tub again, thereby performing centrifugal penetration washing and rinsing processes and also in which the number of rotations of the inner tub is reduced to rotate the inner tub being integrally formed with a pulsator in regular and reverse directions, thereby performing agitation washing and rinsing processes. Also, as laundry and the washing water keep rotating when the inner tub is suddenly stopped to change the direction, the amount of washing water and detergent required for the washing and rinsing processes is reduced and damage to and entangle of the laundry are minimized. Also, the whole washing process time is reduced by reducing water supplying and draining time period.